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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FLANAGAN, KRISTA M

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/936,727

Applicant(s)

MIYOSHI ET AL.

Examiner

Krista M. Flanagan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☐ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/17/2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/27/2001.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Drawings

1. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
2. The drawings are objected to because the specification states that the “an adder 204-2 performs array combining of the directivity B” whereas figure 5 shows the adder that performs the array combining of directivity B as reference character “204-1”.
3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because
 - a. It is suggested that all reference characters be omitted.

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b. Line 1, it is suggested that “one” is omitted and “select” be changed to “selects”.

c. Line 15, it is suggested that the word “basis” be added at the end of the sentence.

Correction is required. See MPEP § 608.01(b).

5. Claims 1-2 and 4-5 are objected to because of the following informalities:

a. Regarding claim 1, it recites the limitation “replica signal generating means for generating a replica signal every directivity based on said detected correlation value” It is suggested that this be changed to “replica signal generating means for generating a replica signal **for** every directivity based on said detected correlation value”.

b. Regarding claim 2,

i. It is suggested that semi-colons be used instead of commas to separate the individual means that comprise the apparatus.

ii. It is suggested that the limitation, “combing means” be changed to “**combining** means”.

iii. It is suggested that the limitation, “temporarily determining means” be changed to “**temporary** determining means”.

iv. It is suggested that the limitation, “dividing means for dividing said re-spread signals every directivity” be changed to “dividing means for dividing said re-spread signals **for** every directivity”.

- v. It is suggested that the limitation, “adding means for adding said re-spread signals divided every directivity” be changed to “adding means for adding said re-spread signals divided **for** every directivity”.
- c. Regarding claim 4, it is suggested that the limitation, “replica signal generating means for generating a replica signal every directivity” be changed to “replica signal generating means for generating a replica signal **for** every directivity”.
- d. Regarding claim 5, it is suggested that the limitation, “generating a replica signal every directivity” be changed to “generating a replica signal **for** every directivity”.

Appropriate correction is required.

- 6. The disclosure is objected to because of the following informalities:
 - a. Throughout the specification it is suggested that “inputted” and “outputted” be changed to “input” and “output”, respectively.
 - b. Page 1, lines 8-9, states “mounted on a base station apparatus used in a base station apparatus used in a mobile communication system of CDMA (Code Division Multiple Access) and which”. It is suggested that this be changed to state, “mounted on a base station apparatus **and** used in a mobile communication system of CDMA (Code Division Multiple Access), which” or “used in a base station apparatus in a mobile communication system of CDMA (Code Division Multiple Access), which”.
 - c. Page 1, line 19, “to deteriorate reception quality as a result of” is suggested to be changed to “reception quality **deteriorates** as a result of”.

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- d. Page 4, line 1, “signals by processing time of ICUs 12-1 to 12-3, and” is suggested to be changed to “signals by **the** processing time of ICUs 12-1 to 12-3, and”.
- e. Page 5, line 1, “desired signal about user 1 every antenna” is suggested to be changed to “desired signal about user 1 **for** every antenna”.
- f. Page 5, line 13, “inference signals” is suggested to be changed to “interference signals”.
- g. Page 6, lines 24-25, “where the signal subjected to temporally determination is multiplied” is suggested to be changed to “where the signal, subjected to **temporary** determination, is multiplied”.
- h. Page 8, lines 9-12, “performs temporarily determination to the RAKE combined signal outputted from the RAKE combiner 27. A signal d, which has been subjected to temporary determination and which outputted from the” is suggested to be changed to “performs **temporary** determination to the RAKE combined signal output from the RAKE combiner 27. A signal d, which has been subjected to temporary determination and output from the”.
- i. Page 9, it is suggested that either the first or second paragraph be omitted.
- j. Page 10, line 2, “replica signal every antenna” is suggested to be changed to “replica signal for every antenna”.
- k. Page 10, line 12, “the reduction” is suggested to be changed to “further reduction”
- l. Page 10, line 13, “more” is suggested to be omitted.
- m. Page 10, line 22, “object” is suggested to be changed to “objective”.

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- n. Page 15, line 23, "inference signals" is suggested to be changed to "interference signals".
- o. Page 18, line 23, and page 19, line 27, "temporarily determination" is suggested to be changed to "**temporary** determination".
- p. Page 21, line 21, it is suggested the "of that the number" be omitted.
- q. Page 22, it is suggested that either the first or second full paragraph be omitted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka et al., US Patent No. 6,157,685.
3. Regarding claim 1, Tanaka discloses an interference canceling apparatus comprising: directivity selecting means for inputting a plurality of array combined signals subjected to array combining on a directivity-by directivity basis to select an array-combined signal corresponding to a path (See figure 3, block 62 - Beam Former and column 3, lines 30-34); despreading means for detecting a correlation value between said selected array-combined signal and a spread code (See figure 2, block 51; column 3, lines 64-67); replica signal generating means for generating a replica signal every directivity

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based on said detected correlation value (See figures 6 and 7, block 11 and 12; column 3, lines 61-64); and canceling means for canceling interference of a desired signal from each of said array combined signals using said generated replica signal (See figures 6 and 7; column 3, lines 61-64 and column 4, lines 1-4).

4. Regarding claim 3, which inherits all of the limitations of claim 1, Tanaka discloses an interference canceling apparatus wherein said canceling means cancels the replica signal of the other user from the array combined signal on a directivity- by- directivity basis (See column 4, lines 5-10).

5. Regarding claim 4, Tanaka discloses a base station apparatus (CDMA system) having an interference canceling apparatus, said interference canceling apparatus comprising: directivity selecting means for inputting a plurality of array combined signals subjected to array combining on a directivity-by-directivity basis to select an array combined signals corresponding to a path (See figure 3, block 62 - Beam Former and column 3, lines 30-34); despreading means for detecting a correlation value between said selected array-combined signal and a spread code (See figure 2, block 51; column 3, lines 64-67); replica signal generating means for generating a replica signal every directivity based on said detected correlation value (See figures 6 and 7, block 11 and 12; column 3, lines 61-64); and canceling means for canceling interference of a desired signal from each of said array combined signals using said generated replica signal (See figures 6 and 7; column 3, lines 61-64 and column 4, lines 1-4).

6. Regarding claim 5, Tanaka discloses an interference canceling method comprising the steps of: inputting a plurality of array combined signals subjected to array combining on a directivity -by-directivity basis to select an array-combined signal corresponding to a

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path (See column 3, lines 30-34); detecting a correlation value between said subjected array combined signal and a spread code (See column 3, lines 64-67); generating a replica signal every directivity based on said detected correlation value (See column 3, lines 61-64); and canceling interference of a desired signal from each of said array combined signals using said generated replica signal (See column 3, lines 61-64 and column 4, lines 1-4).

Allowable Subject Matter

7. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Seki et al., US Patent No. 6,614,766 discloses an interference canceller.
- b. Ishii et al., US Patent No. 6,222,498 discloses a CDMA multi-user receiver featuring a combination of array antenna and multi-user cancellers.
- c. Yoshida, US Patent No. 6,282,233 discloses a multi-user receiving apparatus and CDMA communication system.
- d. Seki et al., US Patent No. 6,667,964 discloses a propagation path estimation method for an interference canceller and interference elimination apparatus.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krista M. Flanagan whose telephone number is (571) 272-2203. The examiner can normally be reached on Monday - Friday, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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TESFALDET BOGURE
PRIMARY EXAMINER

